# SUSCEPTIBILITY RATING OF FORESTS IN SOUTH CAROLINA TO GYPSY MOTH DEFOLIATION

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## ABSTRACT

Commercial forest in South Carolina is rated for susceptibility to defoliation by low level gypsy moth populations. Areas most likely to be defoliated are suitable for population buildup and, therefore, may serve as foci of outbreaks. The Piedmont region has a greater amount of highly susceptible commercial forest than the Coastal Plain.

## INTRODUCTION

Larvae of the gypsy moth, Lymantria dispar L., defoliate hardwoods in the spring, and in the northeastern U.S., finish feeding by late June. Affected trees normally put forth a new complement of leaves, but the energy required to produce these leaves and the loss of photosynthate from the first set greatly reduce subsequent growth (Wargo, 1981). In addition to causing growth loss and possibly mortality, the gypsy moth is especially annoying to the public when large numbers of larvae occur in urban and recreation areas.

It appears to be only a matter of time before the gypsy moth becomes established in South Carolina. It is now established in the northern tier counties of Virginia, where male moths have been trapped in most counties, and multiple life stages have been reported along the Eastern Seaboard. In North Carolina and South Carolina, male moths have been trapped, and other life stages have been found in several locations.

The pattern of spread is well known. Spot infestations, those in advance of the leading edge of the generally infested area, are usually begun through the introduction of gypsy moth life stages by people--on vehicles, camping equipment, outdoor furniture, etc. Therefore, these infestations are usually centered around urban and recreation areas, regardless of the conditions of the surrounding forest type. However, once the entire region becomes generally infested, certain forest stands or conditions are more susceptible to defoliation than others, especially when gypsy moth populations are low. When the population reaches epidemic levels, the insect will invade and heavily defoliate a greater variety of forest stands.

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This report identifies areas of forested land in South Carolina which are most suitable for gypsy moth population increase after the state is generally infested. In the most susceptible forest stands, the appropriate tree species are abundant and conditions do not favor natural enemies. Historically, gypsy moth populations have increased in such stands, which may have served as foci of outbreaks (Valentine and Houston, 1981). During outbreaks, all hardwood stands may be defoliated, but when populations are low, fewer stands are susceptible.

In this report, we identify the portions of South Carolina's forest that are susceptible to defoliation by low populations of gypsy moth. The identification of these areas, which may serve as foci for outbreaks, may help land managers develop plans for dealing with the gypsy moth. We also identify the portion of susceptible forest that is located near people, because this is the area where the greatest control effort will be directed.

## Definition of Susceptibility

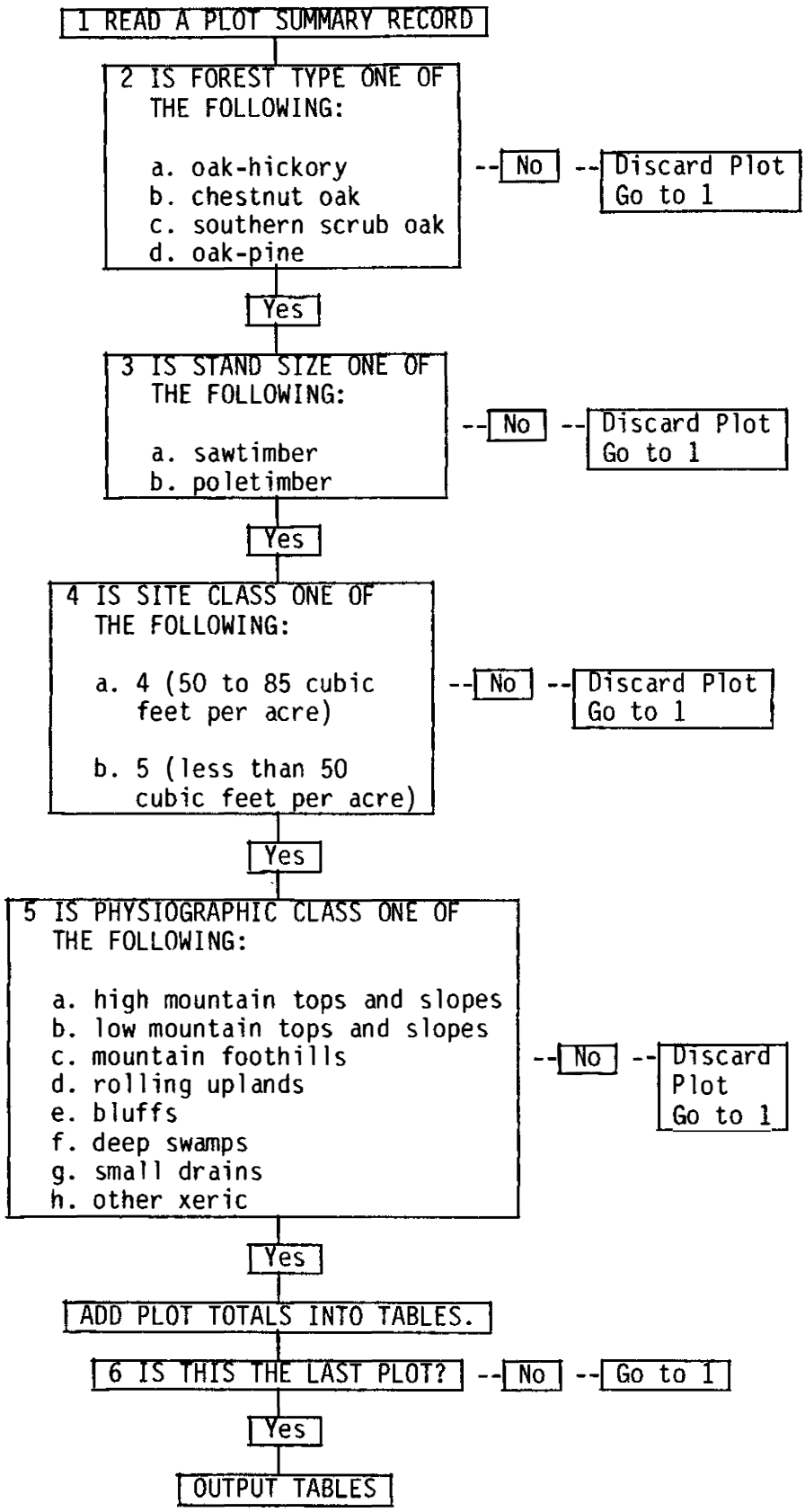
The characteristics of susceptible stands have been identified in the Northeast (Houston and Valentine, 1977). By comparing conditions in stands having various degrees of defoliation, particular species complexes and site conditions were found that favor population increase and subsequent severe defoliation. Gypsy moths attack stands that have a favorable species composition for food and protective niches. Population increase is also dependent on a lack of natural mortality factors--predators, parasites, and diseases.

Houston and Valentine (1977) have shown that forest stands with a large white oak component, growing on dry sites with shallow and/or rocky soils, are most susceptible. White oak is a preferred host, because its leaves have a high nutritional value, and because its rough, scaly bark provides many protective niches for the various life stages of the gypsy moth. On marginal sites (dry ridges, sandy soils, steep slopes, etc.) trees grow slowly, and slow-growing trees tend to have more crooks and looser bark, which provide protective niches for the gypsy moth. A more susceptible stand also does not provide many favorable hiding places for parasites and predators. For instance, if there is a scarcity of litter and debris, then beneficial insect and rodent populations will be low or absent.

# METHODS

The Forest Inventory and Analysis (FIA) project at the Southeastern Forest Experiment Station collects stand information by surveying a number of systematically distributed sample locations throughout each state in the Southeast on a periodic basis. South Carolina was last surveyed in 1978. A Forest Information Retrieval (FIR) system was used to select the most susceptible portion of commercial forest land. The FIR system is a customized data retrieval service offered by FIA for compiling numerous forest statistics for any geographic area of interest. The system also offers the user the flexibility of selecting any combination of stand conditions as screening criteria. Stands which do not meet the specified conditions are excluded from the final data compilations. This feature of the FIR system was used to identify those stands most favorable for gypsy moth population increase. The screening procedure is described in flow diagram format in Figure 1. The state was broken into two

Figure 1--Each plot record within the specified area (Coastal Plain or Piedmont) is subjected to this series of questions.



regions--Coastal Plain and Piedmont--for the analysis. Tables were generated for both regions, and information about the susceptible forest is presented on a county-by-county basis.

Screening criteria were selected which reflect susceptible forest conditions, and these were applied to the 1978 FIA data for the state of South Carolina. The forest types used (oak-hickory, oak-pine, chestnut oak, and southern scrub oak) represent known susceptible species complexes. Stand and site conditions which increase susceptibility were represented by stands capable of producing no more than 85 cubic feet of wood per acre annually (site classes 4 and 5) and by physiographic class (high mountain tops and slopes, low mountain tops and slopes, mountain foothills, rolling uplands, bluffs, other xeric sites, and also deep swamps and small drainages). Stand size (sawtimber and poletimber) was also used as a screening criteria. It is felt that the combination of these forest types and site/stand conditions will select areas which are most susceptible to gypsy moth population increase and defoliation. These forest stands will provide food in the preferred host species, and the trees will quite likely have poor growth form, which provides protective niches for the life stages of the gypsy moth.

A second screening was run to determine how much susceptible forest was located near urban and recreation areas. Only stands that met all screening criteria for susceptibility and had urban buildup or productive/reserved forest land (see Definition of Terms) within a 50-acre circle from the stand's center were selected.

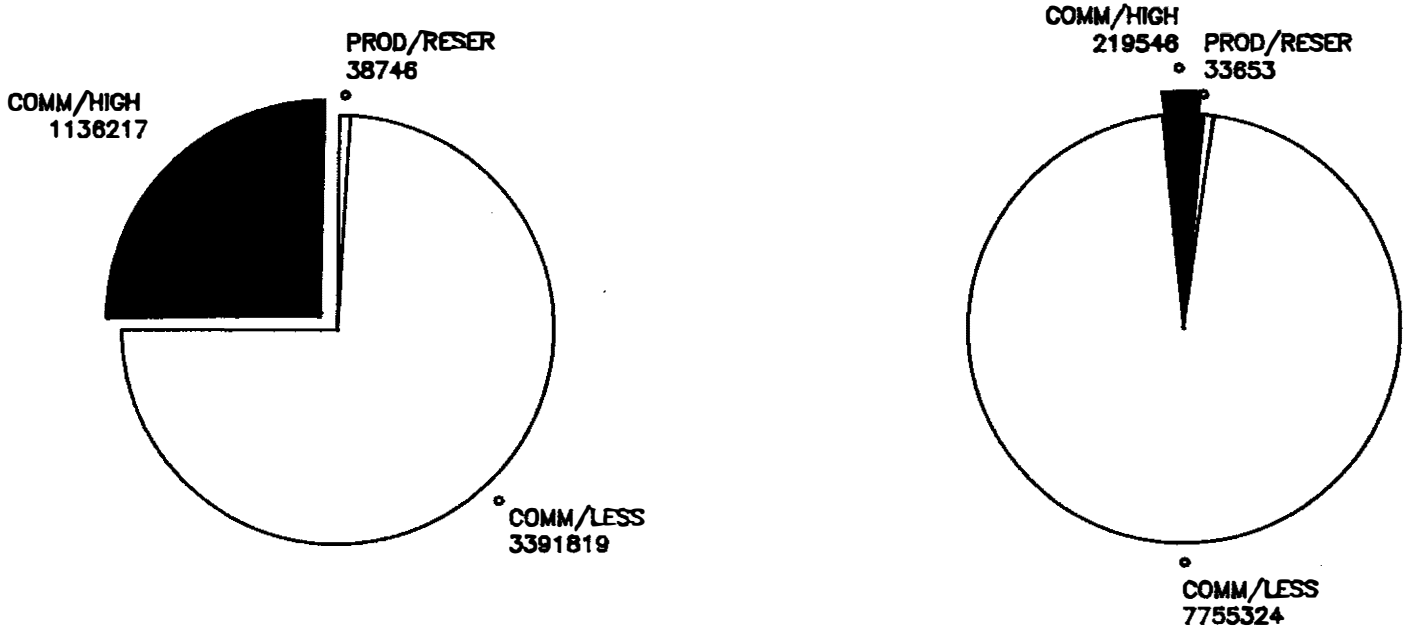
## RESULTS AND DISCUSSION

Approximately one-fourth of the forested land in the Piedmont region is highly susceptible to gypsy moth defoliation. Only 3 percent of the forest is rated as highly susceptible in the Coastal Plain (Figure 2). The map of South Carolina in Figure 3 indicates, on a county-by-county basis, the amount of commercial forest land most susceptible to gypsy moth population increase and defoliation. Counties which have the greatest proportion (26-50%) of highly susceptible forest land are shown in yellow, and those counties with 0-25 percent highly susceptible forest are in white. No county had more than 50 percent of the commercial forest rated as highly susceptible to population increase and defoliation.

Acreage of forested land in each county and its distribution among the three forest classes--commercial, unproductive, and productive/reserved--is shown in Tables 1-3 in the Appendix. The FIR system screened the commercial forest land for susceptibility, and acreage of susceptible commercial forest for each county is also presented in Tables 1-2. In some counties, such as Greenville in the Piedmont region, there are large areas of forest classified as productive/reserved. The productive/reserved forest is not included in the screening process, but it undoubtedly will have some stands which are susceptible to defoliation. Therefore, some highly susceptible stands will not be included in the estimated figures for highly susceptible forest land.

In general, farmers and miscellaneous private owners own most of the highly susceptible forest land, but they also own the majority of commercial forest. Federal ownership of highly susceptible forest land is small across

*Figure 2. Acres of forested land in South Carolina rated for susceptibility to gypsy moth defoliation.*



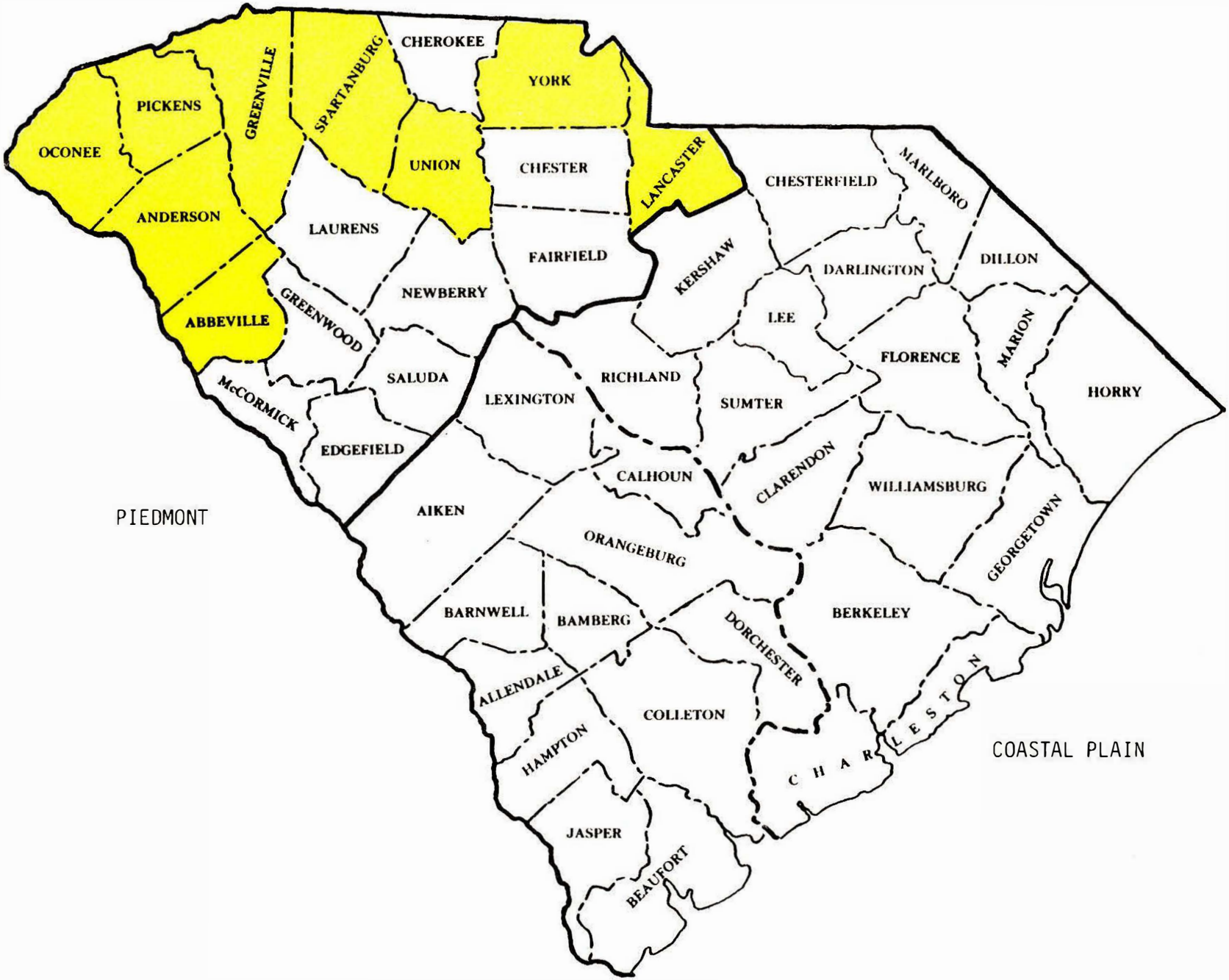

*PIEDMONT REGION*

*COASTAL PLAIN*

*KEY*

*PRODuctive/RESERved*
*COMMercial/LESS susceptible*
*COMMercial/HIGHly susceptible*

Fig e 3.--The portion of commercial forest land which highly susceptible to gypsy moth population increase and defoliation is indicated for each county in South Carolina. Yellow indicates that 26-50% of the commercial forest is highly susceptible. White indicates that 0-25% of the commercial forest is highly susceptible to defoliation or that there is no highly susceptible type.



the state. In the Piedmont, less than 10 percent of susceptible forest land is in the National Forests, and in the Coastal Plain the number is even smaller (Figure 4). The ownership pattern of susceptible forest land within each county is shown in Tables 3-4 in the Appendix.

The Piedmont has a greater volume of timber in the highly susceptible category than the Coastal Plain (Figures 5 and 6). The volumes of sawtimber and all growing stock in the highly susceptible forests for each county are given in Tables 5-6 in the Appendix.

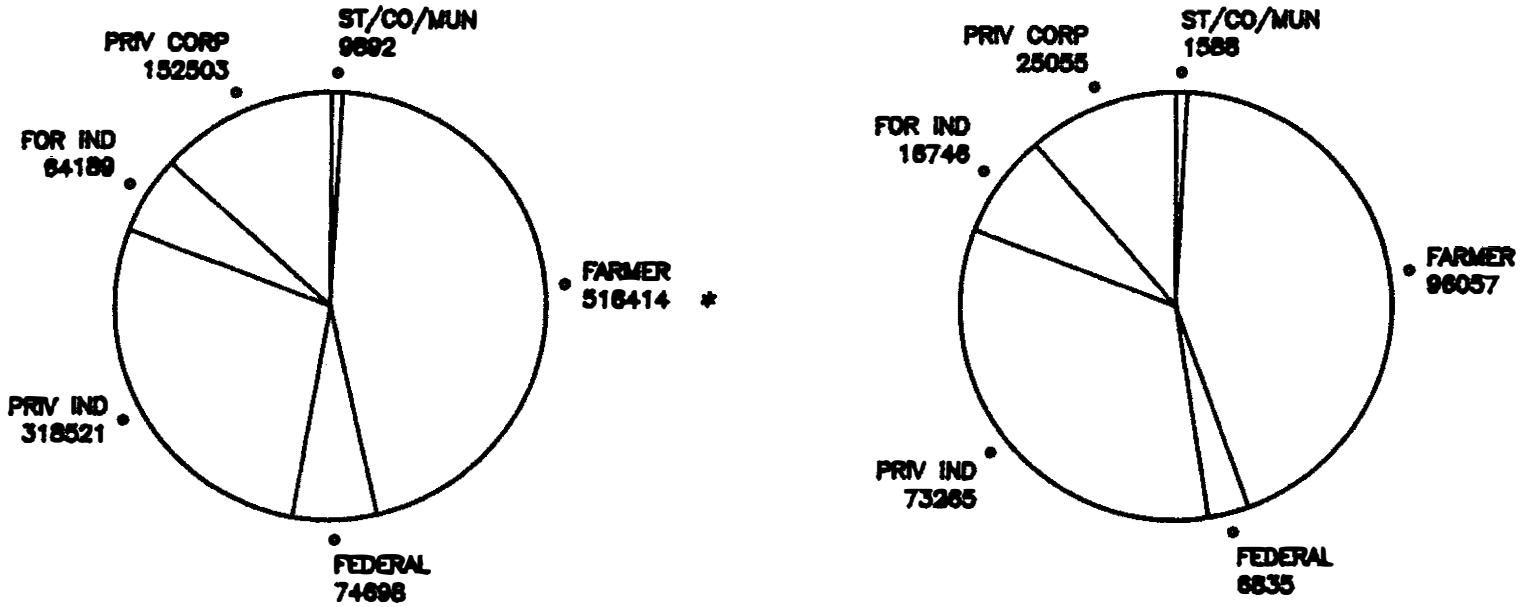
The second analysis indicates that only a small portion of the highly susceptible forest is located near urban buildup or recreation areas (Figure 7). These areas are of special interest, because once the state is generally infested, initial allocation of control resources will be directed here. Traditionally, the gypsy moth has been a "people problem." In the Northeast, where eradication is no longer feasible, control projects are politically motivated and/or economically justified only in urban and recreation areas to reduce the nuisance caused by the insect and to protect foliage. The areas we have identified need primary attention, because gypsy moth populations will probably begin to increase here first. This will result in a heightened public awareness of the problem and similar increase in political pressure to implement control projects. Acreage, by county, of susceptible forest near urban and recreation areas is given in Tables 7 and 8 in the Appendix.

Landowners and land managers can place their particular forested acreages in the highly susceptible category by comparing their forest characteristics to those mentioned previously in the Definition of Susceptibility section and the screening criteria in the METHODS section.

## SUMMARY

Data collected by the Forest Inventory and Analysis project and evaluated through the Forest Information Retrieval system were used to identify the portion of forested land in South Carolina which is most susceptible to gypsy moth population increase and defoliation. But how does susceptibility to defoliation relate to vulnerability or mortality? It has been shown that under similar defoliation regimes with no additional environmental stress there is no difference in the likeliness of mortality occurring in stands having different degrees of susceptibility to defoliation. Mortality following defoliation is dependent on a number of interacting factors: tree species, condition of the tree prior to defoliation, number and severity of previous defoliations, the occurrence of environmental stress before and/or during defoliation, and the presence of secondary organisms. It appears that mortality occurs when defoliated trees are already under stress, and secondary organisms are present and ready to attack after the gypsy moth (Houston, 1981). In order to estimate mortality due to gypsy moth activity, information on these factors must be incorporated into a predictive model. The figures presented in this report are estimates of acreage and volume which are most susceptible to population increase and subsequent defoliation by the gypsy moth, and not predictions of mortality. The next step in the risk rating process would be to predict losses to the gypsy moth in individual stands of interest using a model such as the one developed by Herrick, Gansner, and DeBald (1979).

*Figure 4. Ownership patterns of forest land in South Carolina highly susceptible to gypsy moth defoliation.*

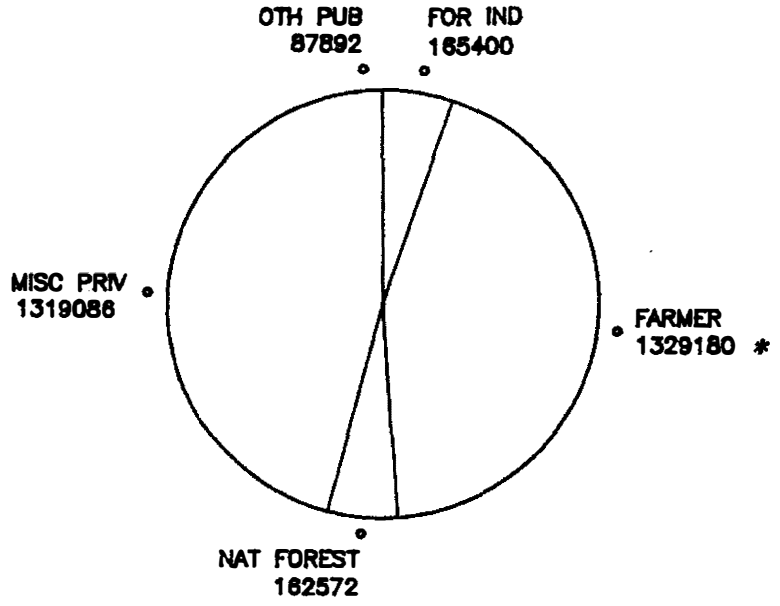



KEY

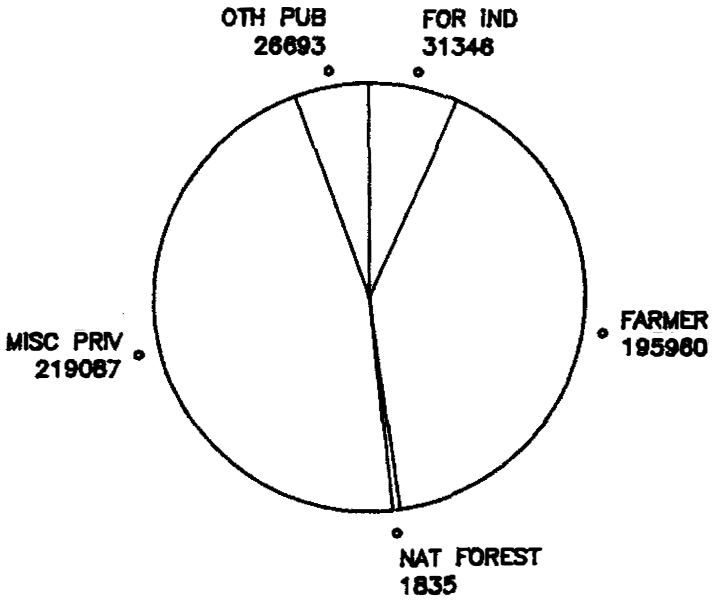
*STate/COunty/MUNicipal*
*PRIVate INDividual*
*FORest INDustry*
*PRIVate CORPoration*

* *acres*

*Figure 5. Volumes of hardwood sawtimber, by ownership class, in forests highly susceptible to gypsy moth defoliation.*




PIEDMONT REGION



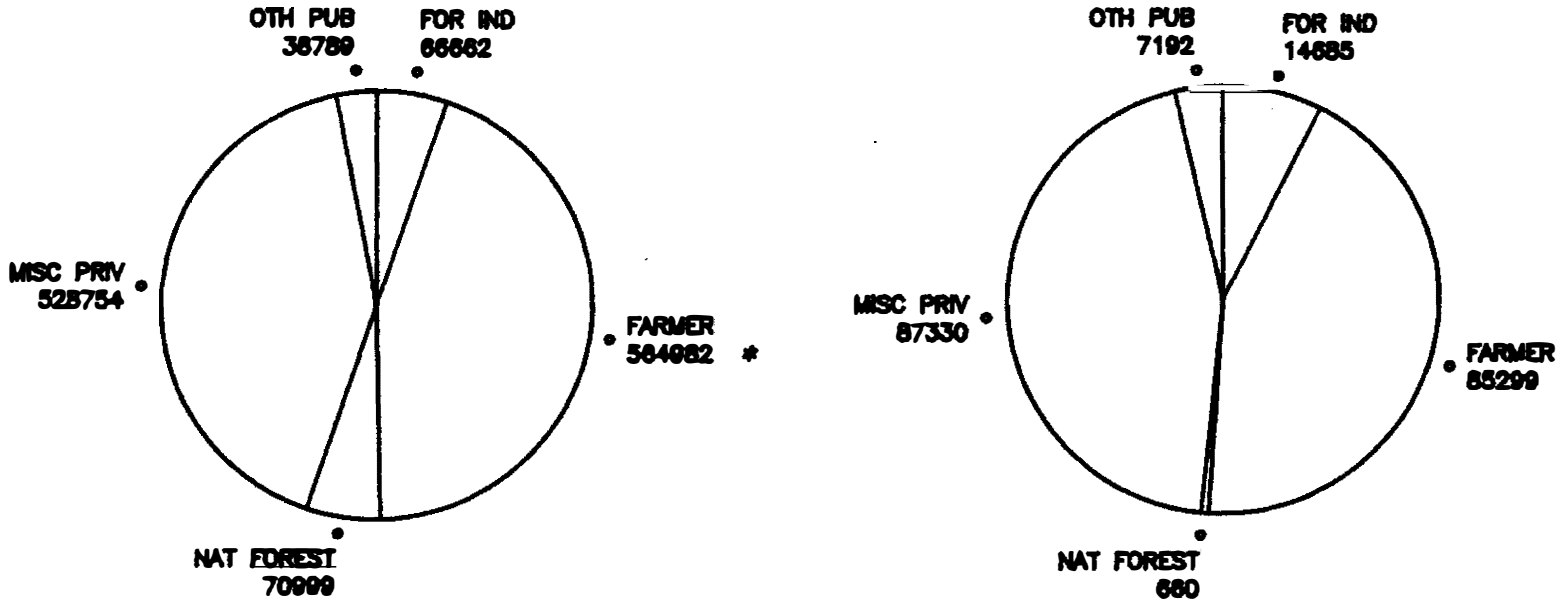

COASTAL PLAIN

KEY

*FORest INDustry*
*NATional FOREST*
*MISCellaneous PRIVate*
*OTHer PUBlic lands*

* *volumes are in thousand board feet*

*Figure 6. Volumes of hardwood growing stock, by ownership class, in forests highly susceptible to gypsy moth defoliation.*




PIEDMONT REGION

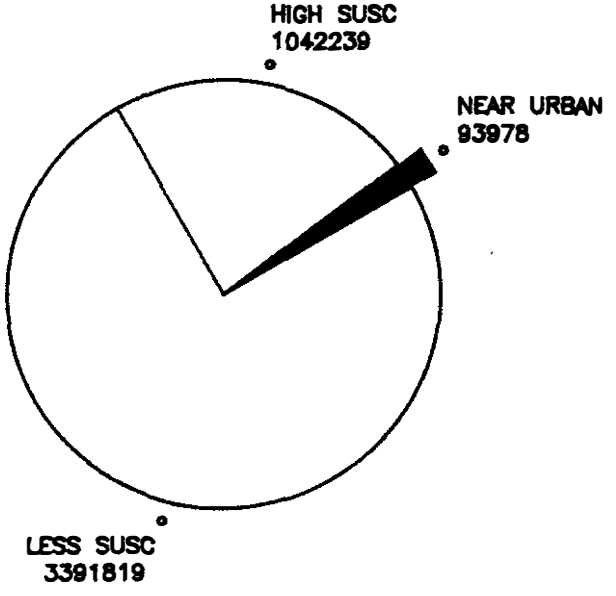
COASTAL PLAIN

KEY

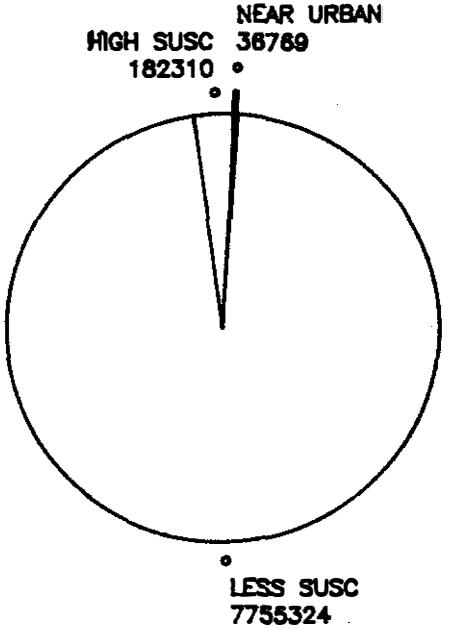
*FORest INDustry*
*NATional FOREST*
*MISCellaneous PRIVate*
*OTHer PUBlic lands*

* *volumes are in thousand cubic feet*

*Figure 7. Acres of commercial forest in South Carolina rated for susceptibility to defoliation and proximity to urban and recreation areas.*




PIEDMONT REGION




COASTAL PLAIN

KEY

*LESS SUSCeptible*
*HIGHly SUSCeptible*
*NEAR URBAN and recreation areas and highly susceptible.*

Definitions of Terms

Commercial forest land. Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization.

Farm. Lands on which agriculture operations are being conducted and sale of agriculture products totaled $1,000 or more during the year.

Farm operator. A person who operates a farm, either doing the work himself or directly supervising the work.

Farm-owned lands. Lands owned by farm operators.

Forest industry lands. Lands owned by companies or individuals operating wood-using plants.

Forest land. Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Forest type. A classification of forest land based upon the species forming a plurality of live-tree stocking.

Oak-pine. Forests in which hardwoods (usually upland oaks) comprise a plurality of the stocking, but in which pines comprise 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar.)

Oak-hickory. Forests in which upland oaks or hickory, singly or in combination, comprise a plurality of the stocking, except where pines comprise 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include yellow-poplar, elm, maple, and black walnut.)

Growing-stock trees. Live trees of commercial species qualifying as desirable or acceptable trees.

Growing-stock volume. Net volume in cubic feet of growing-stock trees 5.0 inches d.b.h. and over from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs. (Net volume in primary forks is included.)

Hardwoods. Dicotyledonous trees, usually broad-leaved and deciduous.

Soft hardwoods. Soft-textured hardwoods such as boxelder, red and silver maple, buckeye, hackberry, loblolly-bay, silverbell (in mountains), butternut, sweetgum, yellow-poplar, cucumbertree, magnolia, sweetbay, water tupelo, blackgum, sycamore, cottonwood, black cherry, willow, basswood, and elm.

Hard hardwoods. Hard-textured hardwoods such as Florida and sugar maple, birch, hickory, dogwood, persimmon (forest-grown), beech, ash, honey-locust, holly, black walnut, mulberry, all commercial oaks, and black locust.

Miscellaneous federal lands. Federal lands other than National Forests, lands administered by the Bureau of Land Management, and Indian lands.

Miscellaneous private lands - corporate. Lands owned by private corporations other than forest industry.

Miscellaneous private lands - individual. Privately owned lands other than forest industry, farmer-owned, or corporate lands.

National Forest lands. Federal lands which have been legally designated as National Forests or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Other public lands. Publicly owned lands other than National Forests.

Poletimber trees. Growing-stock trees of commercial species at least 5.0 inches d.b.h., but smaller than sawtimber size.

Productive/reserved forest land. Forest land sufficiently productive to qualify as commercial forest land, but withdrawn from timber utilization through statute or administrative designation; includes parks and campgrounds not considered in urban buildup.

Sawtimber trees. Live trees of commercial species containing at least a 12-foot sawlog, or two noncontiguous sawlogs, each 8 feet or longer, and with at least one-third of the gross board-foot volume between the 1-foot stump and minimum sawlog top being sound. Softwoods must be at least 9.0 inches and hardwoods at least 11.0 inches d.b.h.

Sawtimber volume. Net volume of the sawlog portion of live sawtimber in board-foot International 1/4-inch rule.

Site class. A classification of forest land in terms of inherent capacity to grow crops of industrial wood based on fully stocked, natural stands.

Class 4. Sites capable of producing 50 to 85 cubic feet per acre annually.

Class 5. Sites incapable of producing 50 cubic feet per acre annually, but excluding unproductive sites.

Stand-size class. A classification of forest land based on the size class of growing-stock trees on the area.

Sawtimber stands. Stands at least 16.7 percent stocked with growing-stock trees, with one-half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands. Stands at least 16.7 percent stocked with growing-stock trees, of which one-half or more of this stocking is in poletimber and sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

State, county, and municipal lands. Lands owned by states, counties, and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Unproductive forest land. Forest land incapable of producing 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions.

Urban buildup. Residential, industrial, and recreation developments. Strip mining operations. Includes areas with concentrations of houses, cabins, or vacation homes.

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# APPENDIX

Table 1.--Piedmont - Area of commercial forest land classified as highly susceptible to defoliation, by county.

| County | Acres of Forest Land | | | Acres of Commercial Forest | | Acres Classified as Highly Susceptible to Defoliation | | % of Forest Type Highly Susceptible to Defoliation | | % of Commercial Forest Highly Susceptible to Defoliation |
|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | Unproductive | Productive/ reserved | Oak/Hickory Type* | Oak/Pine Type | Oak/Hickory Type | Oak/Pine Type | Oak/Hickory Type | Oak/Pine Type | |
| Abbeville | 219,883 | - | 650 | 66,095 | 59,758 | 43,539 | 31,070 | 66 | 52 | 34 |
| Anderson | 208,201 | - | - | 81,297 | 42,948 | 55,967 | 30,396 | 69 | 71 | 41 |
| Cherokee | 154,802 | - | 950 | 62,730 | 23,762 | 17,568 | 15,022 | 28 | 63 | 21 |
| Chester | 290,619 | - | 195 | 55,235 | 34,720 | 23,901 | 21,425 | 43 | 62 | 16 |
| Edgefield | 234,637 | - | - | 83,899 | 27,429 | 15,674 | 19,592 | 19 | 71 | 15 |
| Fairfield | 386,015 | - | - | 50,951 | 46,896 | 30,676 | 24,331 | 60 | 52 | 14 |
| Greenville | 278,448 | - | 21,373 | 177,661 | 26,278 | 77,029 | 15,766 | 43 | 60 | 33 |
| Greenwood | 205,672 | - | 614 | 32,899 | 41,936 | 12,581 | 8,388 | 38 | 20 | 10 |
| Lancaster | 235,604 | - | 329 | 105,961 | 41,398 | 61,439 | 13,799 | 58 | 33 | 32 |
| Laurens | 305,701 | - | - | 100,418 | 40,093 | 53,578 | 22,606 | 53 | 56 | 25 |
| McCormick | 206,778 | - | 258 | 42,892 | 24,393 | 21,442 | 8,827 | 50 | 36 | 15 |
| Newberry | 315,829 | - | - | 48,679 | 32,619 | 23,300 | 18,640 | 48 | 57 | 13 |
| Oconee | 280,294 | - | 4,286 | 109,704 | 65,593 | 59,190 | 45,500 | 54 | 69 | 37 |
| Pickens | 209,464 | - | 5,516 | 119,432 | 34,969 | 81,947 | 13,113 | 69 | 37 | 45 |
| Saluda | 187,758 | - | - | 46,787 | 22,901 | 9,160 | 18,321 | 20 | 80 | 15 |
| Spartanburg | 271,227 | - | 41 | 79,903 | 54,271 | 61,587 | 27,470 | 77 | 51 | 33 |
| Union | 272,352 | - | 34 | 104,965 | 27,209 | 62,749 | 12,097 | 60 | 44 | 27 |
| York | 264,752 | - | 4,500 | 100,548 | 26,427 | 60,909 | 17,618 | 61 | 67 | 30 |
| All Counties | 4,528,036 | - | 38,746 | 1,470,056 | 673,600 | 772,236 | 363,981 | 53 | 54 | 25 |

* The chestnut oak forest type is included under the oak/hickory forest type.

Table 2.--Coastal Plain - Area of commercial forest land classified as highly susceptible to defoliation, by county.

| County | Acres of Forest Land | | | Acres of Commercial Forest | | Acres Classified as Highly Susceptible to Defoliation | | % of Forest Type Highly Susceptible to Defoliation | | % of Commercial Forest Highly Susceptible to Defoliation |
|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | Unproductive | Productive/ reserved | Oak/Hickory Type* | Oak/Pine Type | Oak/Hickory Type | Oak/Pine Type | Oak/Hickory Type | Oak/Pine Type | |
| Aiken | 488,900 | - | 874 | 107,616 | 64,678 | 20,079 | 14,819 | 19 | 23 | 7 |
| Allendale | 158,504 | - | - | 26,562 | 7,710 | - | - | - | - | - |
| Bamberg | 148,440 | - | 355 | 29,432 | 18,254 | - | - | - | - | - |
| Barnwell | 226,228 | - | 129 | 36,120 | 30,665 | 2,797 | 2,865 | 8 | 9 | 3 |
| Beaufort | 140,531 | - | 1,630 | 28,901 | 24,303 | - | - | - | - | - |
| Berkeley | 577,407 | - | 1,296 | 60,463 | 69,621 | 3,141 | - | 5 | - | 1 |
| Calhoun | 130,243 | - | - | 27,774 | 12,344 | 3,086 | - | 11 | - | 2 |
| Charleston | 304,245 | 1,697 | 5,047 | 71,698 | 45,510 | - | 4,038 | - | 9 | 1 |
| Chesterfield | 337,976 | - | 1,201 | 88,721 | 53,867 | 27,867 | 6,934 | 31 | 13 | 10 |
| Clarendon | 217,210 | 514 | 453 | 54,173 | 17,172 | 2,695 | - | 5 | - | 1 |
| Colleton | 476,667 | - | - | 56,760 | 46,756 | 3,017 | - | 5 | - | 1 |
| Darlington | 169,683 | - | - | 63,508 | 31,821 | 2,118 | 2,324 | 3 | 7 | 3 |
| Dillon | 144,331 | - | 648 | 41,396 | 18,283 | - | - | - | - | - |
| Dorchester | 271,334 | - | 310 | 42,222 | 53,326 | - | - | - | - | - |
| Florence | 287,280 | - | - | 35,329 | 46,403 | - | - | - | - | - |
| Georgetown | 374,248 | 1,426 | 2,500 | 38,624 | 61,861 | - | 2,102 | - | 3 | 1 |
| Hampton | 245,589 | - | - | 24,636 | 18,573 | - | - | - | - | - |
| Horry | 489,560 | 256 | 516 | 49,464 | 53,796 | - | - | - | - | - |
| Jasper | 299,706 | - | 13,500 | 28,136 | 20,913 | - | - | - | - | - |
| Kershaw | 394,680 | - | 455 | 81,770 | 53,384 | 20,911 | 9,736 | 26 | 18 | 8 |
| Lee | 118,996 | - | 1,381 | 22,670 | 16,772 | 5,590 | - | 25 | - | 5 |
| Lexington | 267,942 | - | - | 87,202 | 45,215 | 12,919 | 19,377 | 15 | 43 | 12 |
| Marion | 215,743 | - | - | 40,169 | 37,430 | 2,543 | - | 6 | - | 1 |
| Marlboro | 172,181 | - | - | 62,489 | 8,585 | - | - | - | - | - |
| Orangeburg | 369,300 | - | 203 | 83,717 | 57,990 | 6,353 | 3,176 | 8 | 5 | 3 |
| Richland | 327,160 | - | 1,325 | 59,455 | 49,916 | 18,401 | 13,801 | 31 | 28 | 10 |
| Sumter | 231,926 | - | 1,830 | 56,795 | 24,918 | 6,452 | - | 11 | - | 3 |
| Williamsburg | 388,860 | - | - | 69,396 | 54,878 | 2,405 | - | 3 | - | 1 |
| All Counties | 7,974,870 | 3,893 | 33,653 | 1,475,198 | 1,044,944 | 140,374 | 79,172 | 10 | 8 | 3 |

* The southern scrub oak forest type is included under the oak/hickory forest type.

Table 3.--Piedmont - Acres of commercial forest land classified as highly susceptible to defoliation, by ownership and county.

| County | All Ownerships | National Forest | Misc. Federal | State | County and Municipal | Forest Industry | Farmer | Misc. Pri. Corporate | Misc. Pri. Individual |
|---|---|---|---|---|---|---|---|---|---|
| Abbeville | 74,609 | 9,219 | 352 | - | - | 12,531 | 36,351 | 4,039 | 12,117 |
| Anderson | 86,363 | - | 6,998 | 3,032 | 343 | - | 45,594 | 10,132 | 20,264 |
| Cherokee | 32,590 | - | - | - | 88 | - | 26,220 | 1,912 | 4,370 |
| Chester | 45,326 | 5,541 | - | - | - | 5,977 | 21,130 | 8,452 | 4,226 |
| Edgefield | 35,266 | - | - | - | - | - | 19,592 | - | 15,674 |
| Fairfield | 55,007 | - | - | - | - | 10,400 | 28,386 | 4,056 | 12,165 |
| Greenville | 92,795 | - | - | - | - | 3,448 | 42,048 | 21,021 | 26,278 |
| Greenwood | 20,969 | - | - | - | - | - | 4,194 | 4,194 | 12,581 |
| Lancaster | 75,238 | - | - | - | - | 10,840 | 27,599 | 13,800 | 22,999 |
| Laurens | 76,184 | - | - | - | 1,123 | 5,121 | 52,454 | - | 17,486 |
| McCormick | 30,269 | 5,643 | 2,933 | - | - | 6,980 | 8,827 | - | 5,886 |
| Newberry | 41,940 | - | - | - | - | - | 23,300 | - | 18,640 |
| Oconee | 104,690 | 23,165 | - | - | - | - | 27,174 | 27,176 | 27,175 |
| Pickens | 95,060 | - | 818 | 2,451 | - | - | 21,855 | 30,597 | 39,339 |
| Saluda | 27,481 | - | - | - | - | - | 18,321 | 4,580 | 4,580 |
| Spartanburg | 89,057 | - | - | - | 2,065 | - | 41,206 | 13,735 | 32,051 |
| Union | 74,846 | 20,029 | - | - | - | 6,028 | 32,526 | - | 16,263 |
| York | 78,527 | - | - | - | 790 | 2,864 | 39,637 | 8,809 | 26,427 |
| All Counties | 1,136,217 | 63,597 | 11,101 | 5,483 | 4,409 | 64,189 | 516,414 | 152,503 | 318,521 |

Table 4.--Coastal Plain - Acres of commercial forest land classified as highly susceptible to defoliation, by ownership and county.

| County* | All Ownerships | National Forest | Misc. Federal | State | County and Municipal | Forest Industry | Farmer | Misc. Pri. Corporate | Misc. Pri. Individual |
|---|---|---|---|---|---|---|---|---|---|
| Aiken | 34,898 | - | - | - | - | 3,345 | 20,079 | 2,868 | 8,606 |
| Barnwell | 5,662 | - | 2,797 | - | - | - | - | - | 2,865 |
| Berkeley | 3,141 | - | - | - | - | - | 3,141 | - | - |
| Calhoun | 3,086 | - | - | - | - | - | - | - | 3,086 |
| Charleston | 4,038 | 2,648 | 1,390 | - | - | - | - | - | - |
| Chesterfield | 34,801 | - | - | - | 128 | - | 23,115 | 2,312 | 9,246 |
| Clarendon | 2,695 | - | - | - | - | - | 2,695 | - | - |
| Colleton | 3,017 | - | - | - | - | - | 3,017 | - | - |
| Darlington | 4,442 | - | - | - | - | 2,118 | 2,324 | - | - |
| Georgetown | 2,102 | - | - | - | - | - | 2,102 | - | - |
| Kershaw | 30,647 | - | - | - | - | 8,740 | 2,435 | 7,302 | 12,170 |
| Lee | 5,590 | - | - | - | - | - | 2,795 | - | 2,795 |
| Lexington | 32,296 | - | - | - | - | - | 19,377 | - | 12,919 |
| Marion | 2,543 | - | - | - | - | 2,543 | - | - | - |
| Orangeburg | 9,529 | - | - | - | - | - | 3,176 | 3,176 | 3,177 |
| Richland | 32,202 | - | - | - | - | - | 6,900 | 6,901 | 18,401 |
| Sumter | 6,452 | - | - | 1,460 | - | - | 2,496 | 2,496 | - |
| Williamsburg | 2,405 | - | - | - | - | - | 2,405 | - | - |
| All Counties | 219,546 | 2,648 | 4,187 | 1,460 | 128 | 16,746 | 96,057 | 25,055 | 73,265 |

* Counties which are not listed have no susceptible forest type.

Table 5.--Piedmont - Volume of hardwood sawtimber and growing stock on commercial forest land, by county.

| County | Thousand Board Feet | | | Thousand Cubic Feet | | |
|---|---|---|---|---|---|---|
| | Total | Highly Susceptible to Defoliation | % Highly Susceptible to Defoliation | Total | Highly Susceptible to Defoliation | % Highly Susceptible to Defoliation |
| Abbeville | 381,143 | 185,807 | 49 | 153,914 | 93,753 | 61 |
| Anderson | 456,500 | 258,983 | 57 | 177,324 | 103,135 | 58 |
| Cherokee | 156,384 | 70,465 | 45 | 80,388 | 36,342 | 45 |
| Chester | 266,341 | 105,864 | 40 | 110,753 | 40,815 | 37 |
| Edgefield | 275,976 | 118,217 | 43 | 105,813 | 35,809 | 34 |
| Fairfield | 216,914 | 91,143 | 42 | 110,589 | 44,675 | 40 |
| Greenville | 688,658 | 217,157 | 32 | 251,918 | 97,387 | 39 |
| Greenwood | 327,901 | 91,394 | 28 | 105,113 | 29,727 | 28 |
| Lancaster | 285,315 | 189,621 | 66 | 120,607 | 80,225 | 67 |
| Laurens | 482,639 | 209,750 | 43 | 194,745 | 92,134 | 47 |
| McCormick | 240,835 | 63,297 | 26 | 84,492 | 24,735 | 29 |
| Newberry | 381,932 | 88,487 | 23 | 143,924 | 40,864 | 28 |
| Oconee | 375,934 | 232,776 | 62 | 152,562 | 95,307 | 62 |
| Pickens | 590,727 | 311,398 | 53 | 202,551 | 110,671 | 55 |
| Saluda | 191,942 | 52,508 | 27 | 79,122 | 20,427 | 26 |
| Spartanburg | 478,700 | 283,635 | 59 | 183,630 | 116,728 | 64 |
| Union | 621,191 | 318,181 | 51 | 197,577 | 111,136 | 56 |
| York | 418,504 | 175,447 | 42 | 179,424 | 96,316 | 54 |
| All Counties | 6,837,536 | 3,064,130 | 45 | 2,634,446 | 1,270,186 | 48 |

Table 6.--Coastal Plain - Volume of hardwood sawtimber and growing stock on commercial forest land, by county.

| County* | Thousand Board Feet | | | Thousand Cubic Feet | | |
|---|---|---|---|---|---|---|
| | Total | Highly Susceptible to Defoliation | % Highly Susceptible to Defoliation | Total | Highly Susceptible to Defoliation | % Highly Susceptible to Defoliation |
| Aiken | 463,577 | 52,375 | 11 | 156,618 | 24,943 | 16 |
| Barnwell | 336,156 | 20,456 | 6 | 129,490 | 6,115 | 5 |
| Berkeley | 1,132,927 | 22,699 | 2 | 334,507 | 5,398 | 2 |
| Calhoun | 309,093 | 10,131 | 3 | 95,820 | 5,906 | 6 |
| Charleston | 541,326 | 1,835 | <1 | 195,902 | 660 | <1 |
| Chesterfield | 429,359 | 79,432 | 19 | 147,194 | 34,288 | 23 |
| Clarendon | 785,641 | 12,159 | 2 | 252,184 | 3,572 | 1 |
| Colleton | 1,013,172 | 4,416 | <1 | 348,268 | 1,825 | 1 |
| Darlington | 368,909 | 12,001 | 3 | 117,650 | 3,908 | 3 |
| Georgetown | 773,110 | 2,941 | <1 | 254,290 | 1,821 | 1 |
| Kershaw | 360,078 | 50,916 | 14 | 129,048 | 22,473 | 17 |
| Lee | 238,205 | 22,151 | 9 | 83,818 | 8,968 | 11 |
| Lexington | 230,298 | 74,147 | 32 | 77,731 | 29,681 | 38 |
| Marion | 1,057,206 | 6,787 | 1 | 292,459 | 2,605 | 1 |
| Orangeburg | 891,840 | 22,470 | 3 | 336,550 | 8,804 | 3 |
| Richland | 705,940 | 48,013 | 7 | 209,066 | 24,975 | 12 |
| Sumter | 661,175 | 14,258 | 2 | 196,050 | 5,069 | 3 |
| Williamsburg | 757,921 | 17,734 | 2 | 252,672 | 4,155 | 2 |
| All Counties | 11,055,933 | 474,921 | 4 | 3,609,317 | 195,166 | 5 |

* Counties which are not listed have no highly susceptible forest.

Table 7.--Piedmont - Forested land highly susceptible to gypsy moth defoliation and in close proximity to urban buildup or recreation areas.

| County | Highly Susceptible | Highly Susceptible and Near Urban or Recreation Areas |
|---|---|---|
| | - - - - - - - - - - acres - - - - - - - - - - | |
| Anderson | 86,363 | 22,196 |
| Cherokee | 32,590 | 88 |
| Fairfield | 55,007 | 8,111 |
| Greenville | 92,795 | 15,768 |
| Oconee | 104,690 | 9,059 |
| Pickens | 95,060 | 4,371 |
| Spartanburg | 89,057 | 20,380 |
| York | 78,527 | 14,005 |
| Totals | 634,089 | 93,978 |

Table 8.--Coastal Plain - Forested land highly susceptible to gypsy moth defoliation and in close proximity to urban buildup or recreation areas.

| County | Highly Susceptible | Highly Susceptible and Near Urban or Recreation Areas |
|---|---|---|
| | - - - - - - - - - - acres - - - - - - - - - - | |
| Aiken | 34,898 | 11,475 |
| Charleston | 4,038 | 1,390 |
| Chesterfield | 34,801 | 2,312 |
| Lexington | 32,296 | 9,690 |
| Kershaw | 30,647 | 7,302 |
| Richland | 32,202 | 4,600 |
| Totals | 168,882 | 36,769 |

Forest Pest Management
Asheville Field Office

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# SUSCEPTIBILITY RATING OF FORESTS IN SOUTH CAROLINA TO GYPSY MOTH DEFOLIATION

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